

# GEOLOGY AND PALEONTOLOGY

Testimony of Dr. Dal Hunter

## INTRODUCTION

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In the geology and paleontology section, staff discusses the project's potential impacts regarding geological hazards, geological and paleontological resources, and surface water hydrology. The purpose of this analysis is to verify that the applicable laws, ordinances, regulations, and standards (LORS) have been identified and that the project can be designed and constructed in accordance with all applicable LORS, and in a manner that protects environmental quality and assures public health and safety. Energy Commission staff's objective is to ensure that there will be no significant adverse impacts to geological and paleontological resources or surface water hydrology during project construction, operation and closure. The section concludes with staff's proposed monitoring and mitigation measures with respect to geological hazards, geological and paleontological resources, and surface water hydrology, with the inclusion of Conditions of Certification.

## LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (LORS)

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The applicable LORS are listed in the AFC, in sections 8.14, 8.15 and 8.16 (EAEC, 2001a). A brief description of the LORS for surface water hydrology are described in the **Water Resources** section of the staff assessment. A brief description of the LORS for paleontological resources, and geological hazards and resources follows.

### FEDERAL

The proposed East Altamont Energy Center (EAEC) is not located on Federal property but will be interconnected to a federally owned substation. There are no federal LORS for geological hazards and resources or grading for the proposed project. The Federal Antiquities Act of 1906, in part, protects paleontological resources from vandalism and unauthorized collection on federal land (PL 59-209; 16 United States Code section 431 *et seq.*; 34 Stat. 25). The National Environmental Policy Act of 1969, as amended, requires analysis of potential environmental impacts to important historic, cultural and natural aspects of our national heritage (United States Code, section 4321 *et seq.*; 40 Code of Federal Regulations, section 1502.25).

### STATE AND LOCAL

*The California Building Code (CBC)* 1998 edition is based upon the *Uniform Building Code (UBC)*, 1997 edition, which was published by the International Conference of Building Officials. The *CBC* is a series of standards that are used in investigation, design (Chapters 16 and 18) and construction (including grading and erosion control; Appendix Chapter 33). The *CBC* supplements the grading and construction requirements of the *UBC*.

The California Environmental Quality Act (CEQA) Guidelines Appendix G provides a checklist of questions that a lead agency should normally address if relevant to a

project's environmental impacts. The sections of Appendix G that are relevant to an analysis of Geology and Paleontology are as follows:

Section (V) (c) asks if the project will directly or indirectly destroy a unique paleontological resource or site or unique geological feature.

Sections (VI) (a), (b), (c), (d), and (e) pose questions that are focused on whether or not the project would expose persons or structures to geological hazards.

Sections (X) (a) and (b) pose questions about the project's effect on mineral resources.

The Assessment and Mitigation of Adverse Impacts to Non-Renewable Paleontologic Resources is a set of procedures and standards for assessing and mitigating impacts to vertebrate paleontological resources (Society of Vertebrate Paleontologists 1995). These guidelines were developed by a committee of the Society of Vertebrate Paleontologists (SVP), a national organization.

## **ENVIRONMENTAL SETTING**

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The East Altamont Energy Center (EAEC) is proposed to be located on the western edge of the San Joaquin Valley within the Great Valley geomorphic province at 37.803 degrees north latitude by 121.574 degrees west longitude. The project site is in the extreme northeast corner of Alameda County, along the southwestern edge of the Sacramento-San Joaquin River Delta. The 55-acre site is flanked to the north by Byron Bethany Road and to the south by Kelso Road. The Western Area Power Administration (Western) Tracy Substation lies across Mountain House Road to the southwest while undeveloped agricultural land occurs to the east.

The project would involve the design, construction and operation of an 820-megawatt (MW) natural-gas-fired combined-cycle generating plant, augmented by 267 MW of duct firing. Two new double-circuit 230-kV transmission lines, approximately 0.5 miles each, will connect the new switchyard to an existing 230-kV double-circuit transmission line that will be sectionalized to provide interconnections with Western's Tracy Substation and the Westley Substation. The new lines will be installed over agricultural land and Kelso and Mountain House Roads. New electrical equipment will also be installed within the existing boundaries of the Tracy and Westley substations. The new switchyard, ownership of which will be transferred to Western, will function as an extension of the Tracy Substation. Natural gas for the facility will be delivered via approximately 1.8 miles of new 20-inch pipeline that will connect to Pacific Gas and Electric's (PG&E) existing gas pipeline west of the site. Raw water for cooling tower and process makeup water will initially be supplied by Byron Bethany Irrigation District (BBID), probably via a 2.1-mile pipeline west of the site. Several alternate waterline routes are being considered, including two routes for future reclaimed water to be brought from east of the project. None of the alternates affect the conclusions of this evaluation.

The project site is not crossed by any known active faults. The depth to ground water can vary from 0 to 10 feet below existing grade. Groundwater movement is very slow

due to lack of irrigation pumping, low permeability, and the high water table in the Delta (Hill and Associates, 1964). Site near-surface geology consists of alluvial fan deposits of Holocene age underlain by semi-consolidated deposits of Pliocene-Pleistocene age. The unconsolidated alluvium consists of highly variable gravel, sand, silt and clay units deposited in fans extending from the nearby Coast Range Mountains. The underlying semi-consolidated deposits consist of weakly cemented conglomerate, sandstone and siltstone.

The project site lies at an elevation of approximately 40 feet above mean sea level.

Existing grade at the power plant site slopes approximately one percent to the north.

The existing site drainage is sheet flow in nature. A more complete discussion of on-site drainage is included in the **Water Resources** section of this staff assessment

## ANALYSIS AND IMPACTS

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### GEOLOGICAL HAZARDS

#### Faulting and Seismicity

The project is located within seismic zone 4 as delineated on Figure 16-2 of the 1998 edition of the *CBC*. Energy Commission staff reviewed the Fault Activity Map of California and Adjacent Areas with Locations and Ages of Recent Volcanic Eruptions, dated 1994 (CDMG 1994). No active faults have been identified within the power plant footprint. A number of active faults lie within a 25-mile radius of the site. All of these faults are classified as Type B seismic sources, as defined in the 1997 *UBC* and the *CBC* (1998). These codes define three seismic source types: A, B, and C. Type A faults, such as the San Andreas Fault System, are those with an average annual slip rate greater than 5 mm per year and the potential to generate a moment magnitude ( $M_w$ ) earthquake of at least 7.0. Type C faults are those with a slip rate of 2 mm or less per year and a maximum moment earthquake of less than 6.5. Type B faults, the largest grouping, are all active faults not defined as Type A or C.

The closest active faults to the project are the Midway Fault Zone (3.5 miles southwest of the EAEC) and the Vernalis fault (5.0 miles east of the EAEC). The Midway Fault Zone is considered the northwest extension of the San-Joaquin Fault Zone and both are considered segments of the Great Valley Thrust Fault Zone (GVTFZ). The GVTFZ extends from Red Bluff in northern California to northwest of Bakersfield in the southern San Joaquin Valley. The Midway Fault Zone has the potential to generate a maximum credible earthquake (MCE) of ( $M_w$ ) 6.75. The Vernalis fault is a northwest-trending fault that has had displacement within Holocene time and a calculated MCE of  $M_w$  7.5. Other faults near the project site include the Midland fault, the Greenville fault and the Calaveras fault. The Midland fault is located 6 miles north of the project site though recurrence interval and MCE are unknown. The Greenville fault is 9 miles southwest of the EAEC site and right-lateral displacement has occurred within Holocene time. The displacement rate on the Greenville fault is calculated at 2.0 millimeters per year and the MCE is  $M_w$  6.9. The Calaveras fault is located 21 miles west of the EAEC site and has a calculated right-lateral displacement rate of 6 mm/yr. The MCE for the Calaveras fault is  $M_w$  6.9.

The applicant estimates that the peak horizontal ground acceleration for the design earthquake (with a 10 percent probability in 50 year return interval) is 0.46g [46 percent of the acceleration of gravity] (EAEC, 2001a, page 8.15-5). This is based on a 6.75 M<sub>w</sub> earthquake along the Midway-San Joaquin fault. A peak horizontal ground acceleration of this intensity could cause instability and liquefaction of EAEC foundation soils, depending on the soil conditions actually present. Seismic concerns will be addressed by implementation of proposed Condition of Certification **GEN-1 (FACILITY DESIGN)**. Proper design in accordance with this condition should adequately mitigate seismic hazards to the current standards of practice.

### **Liquefaction, Hydrocompaction, Subsidence, and Expansive Soils**

Liquefaction is a condition in which a cohesionless or even slightly plastic soil may lose shear strength due to a sudden increase in pore water pressure. Four of the parameters used to assess the potential for liquefaction are the density, depth to groundwater, texture, and the peak horizontal ground acceleration estimated for the site. The project site is located directly adjacent to an area mapped as liquefaction hazard zone (Contra Costa County, 1996). The depth to ground water at the project is approximately 10 to 15 feet below existing grade. The Applicant has conducted a design-level geotechnical investigation of the EAEC site that includes a liquefaction analysis based on standard methodology (Kleinfelder, 2001). The analysis indicates only localized liquefaction potential with surface settlement of one-half inch or less. From this evaluation, staff concludes that liquefaction is not a significant concern for this project.

Hydrocompaction is the process of the loss of soil volume upon the application of water. The potential for significant compaction due to hydrocompaction is considered remote since the ground water table at the site is shallow. The project geotechnical investigation did not identify soils with hydrocompaction potential at this site (Kleinfelder, 2001).

Subsidence of surficial and near surface soil units may be induced at the site by either strong ground shaking due to a large nearby earthquake, by consolidation of loose or soft soils due to heavy loading of the soils by large structures, or by the extraction of fluids from the subsurface. The Applicant has stated that no known subsidence problems exist in the project area, though the presence of loose or soft soils at the site has not yet been determined. The project geotechnical investigation did not identify subsidence potential at this site (Kleinfelder, 2001).

Soils that contain a high percentage of expansive clay minerals are prone to expansion, if subjected to an increase in water content. Expansive soils are usually measured with an index test such as the expansive index potential. In order for a soil to be a candidate for testing, the soil must have a high clay content and the clay must have a high shrink-swell potential and a high plasticity index. The project geotechnical investigation has identified a significant shrink-swell (expansion) hazard for lightly loaded foundations, floor slabs, and exterior flatwork and pavements. Three mitigation alternates are discussed in the report (Kleinfelder, 2001).

Conditions of Certification **GEN-1**, **GEN-5** and **CIVIL-1** (contained in the **FACILITY DESIGN** section) would mitigate the above hazards to a less than significant level.

### **Landslides**

The EAEC site is essentially flat and is located over one mile from the nearest mountain. Since no significant excavation is planned during site construction, the potential for impact from landslides at the site is considered nonexistent. The project geotechnical investigation has verified that the slopes for evaporation and storage ponds to be constructed on this site will be stable at proposed slope ratios up to 3:1 (horz:vert) (Kleinfelder, 2001).

## **GEOLOGICAL AND PALEONTOLOGICAL RESOURCES**

The project location is designated as Mineral Resources Zone-3, an area of undetermined mineral resources potential (CDMG Special Report 143). No mineral resources have been identified at the present site and there are no significant sand or gravel mines in the area.

Energy Commission staff has reviewed the paleontological resources technical report (East Altamont, 2001a, AFC Appendix L and section 8.16). In addition to research at museums and universities, the project paleontologist made a site survey visit and paleontologic inventory, as part of his report. The site can be divided into two lithologically similar units. Both have yielded significant finds of vertebrate fossils in other areas of Alameda County, but neither is known to have shown fossils at the proposed EAEC site. The nearest documented fossil locality is less than one-half mile west-southwest of the EAEC and is designated by the University of California, Berkley Museum of Paleontology as site UCMP V4801. Fossil bones of a mammoth and rodents were found at this site, in Quaternary alluvium, during construction of the Delta-Mendota Canal. The older unit, the Tulare Formation, is thought to be Late Pleistocene to Pleistocene in age and is slightly tilted, which aids in differentiating the Tulare Formation from the younger, overlying and flat-lying Quaternary Alluvial deposits. The Quaternary Alluvial deposits occur near the ground surface and will be disturbed by construction activities, both at the plant site and along the linear support facilities. Most of the area has been cultivated for many years, so that the upper foot or so has already been severely disturbed. Deeper excavations will encounter undisturbed zones of the Quaternary Alluvium and, possibly, the underlying Tulare Formation. Energy Commission staff has proposed Conditions of Certification, below, that will ensure that the applicant mitigates impacts upon paleontological resources to a less than significant level should they be encountered during construction, operation, or closure of the project.

## **SURFACE WATER HYDROLOGY**

The rainy season at the EAEC site is typical of the central Sacramento Valley, extending from November through March. Summer months are typically dry with occasional thunderstorms and minor rain sometimes occurring during the spring and fall. The average annual precipitation for the site is about 12 inches, based on records from the nearby Tracy area.

The EAEC site lies outside the 100-year flood zone, as designated by the Federal Emergency Management Agency (FEMA, 2000). The EAEC site is located near the confluence of two major rivers, as well as diversion facilities for both the Central Valley Project and the California State Water Project.

Stormwater runoff across the project site currently runs to the north by sheet flow to be collected in an east/west drainage ditch. This ditch discharges into a drain along the east side of the property that flows to the north, ultimately discharging into the intake channel of the Delta-Mendota Canal. Soils are noted to have poor drainage.

The County of Alameda requires detention of the 100-year, 24-hour storm with discharge metered to less than or equal to the pre-development 10-year, 24-hour storm event. The applicant has calculated the total runoff from the 32.5-acre project paved area of the proposed EAEC site as approximately 10.46 acre-feet (3.41 million gallons) for the 100-year storm in 24 hours, and 3.01 acre-feet for the pre-development 10-year storm, again for a 24-hour period. The study provided by the applicant indicates that the post-construction runoff is 70 percent higher than the pre-construction storm water runoff for the 100-year event. (EAEC, 2001a).

Following construction, storm water will drain to a stormwater detention pond via a system of drains, channels, and pipes. Preliminary design indicates a detention pond about three acres in size and with a depth of three feet. The applicant has proposed the use of Best Management Practices (BMPs) for erosion and sediment control in order to avoid polluting surface waters during construction. Setbacks incorporated in the design, BMPs, and on-site drainage structures will be designed to protect local surface water from water quality impacts. Condition of Certification **CIVIL-1 (Facility Design)**, along with specific conditions presented under **Water Resources**, will mitigate surface water impacts to less than significant levels.

## **SITE SPECIFIC IMPACTS**

No known geological resources will be impacted by the construction and operation of the project, including its linear facilities. The (confidential) Paleontological Resources Technical Report (EAEC, 2001a; Appendix 8.16) assigns ratings of "Highly Sensitive" to both of the geologic units that may underlie the cultivated surface soils at this site. No vertebrate fossils have been found at the project site, although there is some documentation of a fossil site within one-half mile of the EAEC. Since there is to be considerable grading, Energy Commission staff believes there is at least a moderate probability of encountering paleontological resources. The confidential paleontological report submitted by the Applicant classified the geologic units in the site area as "highly sensitive." The recommended Conditions of Certification **PAL-1 through PAL-7** will mitigate potential geologic/paleontologic impacts to less than significant levels.

## **CUMULATIVE IMPACTS**

The EAEC lies in an area of no known or likely geologic resources such as minerals, aggregates, oil or natural gas. In the event that paleontological resources are revealed during grading, a mitigation plan will be in place to assure proper protection and

recovery. Increased surface water from construction of impermeable surfaces can be handled by a properly designed surface water drainage system.

As a consequence of the above factors, it is staff's opinion that the potential for a significant adverse cumulative impact on paleontological resources, geological resources, or surface water hydrology is unlikely, if the project is constructed according to the recommended Conditions of Certification. There are a number of other electric power generating plants being considered in the area, including the Tesla, Tracy, and Mountain House projects. Any environmental impacts related to geology, mineral resources, paleontology, or surface water hydrology at the proposed EAEC would not be expected to be cumulative with impacts of other power projects. These projects are at least 5 miles to the south-southwest of the EAEC.

## **FACILITY CLOSURE**

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A definition and general approach to closure is presented in the **General Conditions** section of this document. Facility closure activities are not anticipated to impact geological or paleontological resources. This is due to the fact that no paleontological or geological resources are known to exist at the power plant location. In addition, decommissioning and closure of the power plant should not negatively affect geological or paleontological resources since the majority of the ground disturbed in plant decommissioning and closure would have been disturbed in the construction and operation of the plant. Surface water hydrology impacts will depend upon the closure activities proposed. A facility closure plan will be developed prior to closure to ensure that no significant impacts occur as a result of closure activities.

## **RESPONSE TO PUBLIC AND AGENCY COMMENTS**

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Energy Commission staff received no comments regarding geology, paleontology or surface water from City, County, State, or Federal agencies. One comment from the public, designated as "G&DK-10" asked, "How close to the center of the earthquake fault is this area?" Earthquake faults are discussed above under Faulting and Seismicity. The nearest fault to the site is the Midway Fault, 3.5 miles to the southwest

## **CONCLUSIONS AND RECOMMENDATIONS**

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If built, the project, including linear facilities, would have no adverse impact on geological and paleontological resources and surface water hydrology. Staff proposes to assure compliance with applicable LORS for geological hazards, paleontological resources, and surface water hydrology, with implementation of Conditions of Certification. General Conditions of Certification with respect to geology are covered under Conditions of Certification **GEN-1**, **GEN-5**, and **CIVIL-1** in the **FACILITY DESIGN** section.

## **PROPOSED CONDITIONS OF CERTIFICATION**

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General Conditions of Certification with respect to Geology are covered under Conditions of Certification **GEN-1**, **GEN-5**, and **CIVIL-1** in the **FACILITY DESIGN**

section. Conditions of Certification related to paleontological resources are presented below:

**PAL-1** The project owner shall provide the CPM with the resume and qualifications of its Paleontological Resource Specialist (PRS) and Paleontological Resource Monitors (PRMs) for review and approval. If the approved PRS or one of the PRMs is replaced prior to completion of project mitigation and report, the project owner shall obtain CPM approval of the replacement.

The resume shall include the names and phone numbers of contacts. The resume shall also demonstrate to the satisfaction of the CPM, the appropriate education and experience to accomplish the required paleontological resource tasks.

As determined by the CPM, the PRS shall meet the minimum qualifications for a vertebrate paleontologist as described in the Society of Vertebrate Paleontologists (SVP) guidelines of 1995. The experience of the PRS shall include the following:

- 1) institutional affiliations or appropriate credentials and college degree;
- 2) ability to recognize and recover fossils in the field;
- 3) local geological and biostratigraphic expertise;
- 4) proficiency in identifying vertebrate and invertebrate fossils;
- 5) publications in scientific journals; and
- 6) the PRS shall have at least three years of paleontological resource mitigation and field experience in California, and at least one year of experience leading paleontological resource mitigation and field activities.

The PRS shall obtain qualified paleontological resource monitors to monitor as necessary on the project. Paleontologic resource monitors (PRMs) shall have the equivalent of the following qualifications:

- 1) BS or BA degree in geology or paleontology and one year experience monitoring in California; or
- 2) AS or AA in geology, paleontology or biology and four years experience monitoring in California; or
- 3) Enrollment in upper division classes pursuing a degree in the fields of geology or paleontology and two years of monitoring experience in California.

**Verification:** At least 60 days prior to the start of ground disturbance, the project owner shall submit a resume and statement of availability of its designated PRS for on-site work.

At least 20 days prior to ground disturbance, the PRS or project owner shall provide a letter with resumes naming anticipated monitors for the project and stating that the



identified monitors meet the minimum qualifications for paleontological resource monitoring required by the condition. If additional monitors are obtained during the project, the PRS shall provide additional letters and resumes to the CPM for approval. The letter shall be provided to the CPM no later than one week prior to the monitor beginning on-site duties.

Prior to the termination or release of a PRS, the project owner shall submit the resume of the proposed new PRS to the CPM for review and approval.

**PAL-2** The project owner shall provide to the PRS and the CPM, for approval, maps and drawings showing the footprint of the power plant and all linear facilities. Maps shall identify all areas of the project where ground disturbance is anticipated. If the PRS requests enlargements or strip maps for linear facility routes, the project owner shall provide copies to the PRS and CPM. The site grading plan and the plan and profile drawings for the utility lines would normally be acceptable for this purpose. The plan drawings should show the location, depth, and extent of all ground disturbances and can be 1 inch = 40 feet to 1 inch = 100 feet range. If the footprint of the power plant or linear facility changes, the project owner shall provide maps and drawings reflecting these changes to the PRS and CPM.

If construction of the project will proceed in phases, maps and drawings may be submitted prior to the start of each phase. A letter identifying the proposed schedule of each project phase shall be provided to the PRS and CPM. Prior to work commencing on affected phases, the project owner shall notify the PRS and CPM of any construction phase scheduling changes.

At a minimum, the PRS shall consult weekly with the project superintendent or construction field manager to confirm area(s) to be worked during the next week, until ground disturbance is completed.

**Verification:** At least 30 days prior to the start of ground disturbance, the project owner shall provide the maps and drawings.

If there are changes to the footprint of the project, revised maps and drawings shall be provided at least 15 days prior to the start of ground disturbance.

If there are changes to the scheduling of the construction phases, the project owner shall submit a letter to the CPM within 5 days of identifying the changes.

**PAL-3** The PRS shall prepare, and the project owner shall submit to the CPM for review and approval, a Paleontological Resources Monitoring and Mitigation Plan (PRMMP) to identify general and specific measures to minimize potential impacts to significant paleontological resources. Approval of the PRMMP by the CPM shall occur prior to any ground disturbance. The PRMMP shall function as the formal guide for monitoring, collecting and sampling activities and may be modified with CPM approval. This document shall be used as a basis for discussion in the event that on-site decisions or changes are proposed. Copies of the PRMMP shall reside with the PRS, each monitor, the project owner's on-site manager, and the CPM.

The PRMMP shall be developed in accordance with the guidelines of the Society of the Vertebrate Paleontologists (SVP, 1995) and shall include, but not be limited to, the following:

- 1) Assurance that the performance and sequence of project-related tasks, such as any literature searches, pre-construction surveys, worker environmental training, fieldwork, flagging or staking; construction monitoring; mapping and data recovery; fossil preparation and recovery; identification and inventory; preparation of final reports; and transmittal of materials for curation will be performed according to the PRMMP procedures;
- 2) Identification of the person(s) expected to assist with each of the tasks identified within the PRMMP and all conditions for certification;
- 3) A thorough discussion of the anticipated geologic units expected to be encountered, the location and depth of the units relative to the project when known, and the known sensitivity of those units based on the occurrence of fossils either in that unit or in correlative units;
- 4) An explanation of why, how, and how much sampling is expected to take place and in what units. Include descriptions of different sampling procedures that shall be used for fine-grained and coarse-grained beds;
- 5) A discussion of the locations of where the monitoring of project construction activities is deemed necessary, and a proposed schedule for the monitoring;
- 6) A discussion of the procedures to be followed in the event of a significant fossil discovery, including notifications;
- 7) A discussion of equipment and supplies necessary for recovery of fossil materials and any specialized equipment needed to prepare, remove, load, transport, and analyze large-sized fossils or extensive fossil deposits;
- 8) Procedures for inventory, preparation, and delivery for curation into a retrievable storage collection in a public repository or museum, which meets the Society of Vertebrate Paleontologists standards and requirements for the curation of paleontological resources;
- 9) Identification of the institution that has agreed to receive any data and fossil materials recovered, requirements or specifications for materials delivered for curation and how they will be met, and the name and phone number of the contact person at the institution; and
- 10) A copy of the paleontological conditions of certification.

**Verification:** At least thirty (30) days prior to ground disturbance, the project owner shall provide a copy of the PRMMP. The PRMMP shall include an affidavit of authorship by the PRS, and acceptance of the project owner evidenced by a signature

**PAL-4** Prior to ground disturbance and for the duration of construction, the project owner and the PRS shall prepare and conduct weekly CPM-approved training

for all project managers, construction supervisors and workers who operate ground disturbing equipment or tools. Workers to be involved in ground disturbing activities in sensitive units shall not operate equipment prior to receiving worker training. The training program may be combined with other training programs prepared for cultural and biological resources, hazardous materials, or any other areas of interest or concern.

The Worker Environmental Awareness Program (WEAP) shall address the potential to encounter paleontological resources in the field, the sensitivity and importance of these resources, and the legal obligations to preserve and protect such resources. In-person training shall be provided for each new employee involved with ground disturbing activities, while these activities are occurring in highly sensitive geologic units, as detailed in the PRMMP. The in-person training shall occur within four days following a new hire for highly sensitive sites and as established by the PRMMP for sites of moderate, low, and zero sensitivity. Provisions will be made to provide the WEAP training to workers not fluent in English.

The training shall include:

- 1) A discussion of applicable laws and penalties under the law;
- 2) For training in locations of high sensitivity, the PRS shall provide good quality photographs or physical examples of vertebrate fossils that may be expected in the area;
- 3) Information that the PRS or PRM has the authority to halt or redirect construction in the event of a discovery or unanticipated impact to a paleontological resource;
- 4) Instruction that employees are to halt or redirect work in the vicinity of a find and to contact their supervisor and the PRS or PRM;
- 5) An informational brochure that identifies reporting procedures in the event of a discovery;
- 6) A Certification of Completion of WEAP form signed by each worker indicating that they have received the training; and
- 7) A sticker that shall be placed on hard hats indicating that environmental training has been completed.

**Verification:** At least 30 days prior to ground disturbance, the project owner shall submit the proposed WEAP including the brochure with the set of reporting procedures the workers are to follow.

At least 30 days prior to ground disturbance, the project owner shall submit the script and final video to the CPM for approval if the project owner is planning on using a video for interim training.

If an alternate paleontological trainer is requested by the owner, the resume and qualifications of the trainer shall be submitted to the CPM for review and approval. Alternate trainers shall not conduct training prior to CPM authorization.

The project owner shall provide in the Monthly Compliance Report the WEAP copies of the Certification of Completion forms with the names of those trained and the trainer for each training offered that month. The Monthly Compliance Report shall also include a running total of all persons who have completed the training to date.

**PAL-5** The PRS and PRM(s) shall monitor consistent with the PRMMP, all construction-related grading, excavation, trenching, and augering in areas where potentially fossil-bearing materials have been identified. In the event that the PRS determines full time monitoring is not necessary in locations that were identified as potentially fossil-bearing in the PRMMP, the PRS shall notify and seek the concurrence of the CPM.

The PRS and PRM(s) shall have the authority to halt or redirect construction if paleontological resources are encountered. The project owner shall ensure that there is no interference with monitoring activities unless directed by the PRS. Monitoring activities shall be conducted as follows:

- 1) Any change of monitoring different from the accepted schedule presented in the PRMMP shall be proposed in a letter from the PRS and the project owner to the CPM prior to the change in monitoring. The letter shall include the justification for the change in monitoring and submitted to the CPM for review and approval.
- 2) PRM(s) shall keep a daily log of monitoring of paleontological resource activities. The PRS may informally discuss paleontological resource monitoring and mitigation activities with the CPM at any time.
- 3) The PRS shall immediately notify the project owner and the CPM of any incidents of non-compliance with any paleontological resources conditions of certification. The PRS shall recommend corrective action to resolve the issues or achieve compliance with the conditions of certification.
- 4) For any significant paleontological resources encountered, either the project owner or the PRS shall notify the CPM immediately (no later than the following morning after the find, or Monday morning in the case of a weekend) of any halt of construction activities.

The PRS shall prepare a summary of the monitoring and other paleontological activities that will be placed in the Monthly Compliance Reports. The summary will include the name(s) of PRS or monitor(s) active during the month; general descriptions of training and construction activities and general locations of excavations, grading, etc. A section of the report will include the geologic units or subunits encountered; descriptions of sampling within each unit; and a list of fossils identified in the field. A final section of the report will address any issues or concerns about the project relating to paleontologic monitoring including any incidents of non-compliance and any changes to the monitoring plan that have been approved by the CPM. If no monitoring took place

during the month, the project shall include a justification in summary as to why monitoring was not conducted.

**Verification:** The PRS shall submit the summary of monitoring and paleontological activities in the Monthly Compliance Report.

**PAL-6** The project owner, through the designated PRS, shall ensure the recovery, preparation for analysis, analysis, identification and inventory, the preparation for curation, and the delivery for curation of all significant paleontological resource materials encountered and collected during the monitoring, data recovery, mapping, and mitigation activities related to the project.

**Verification:** The project owner shall maintain in their compliance file copies of signed contracts or agreements with the designated PRS and other qualified research specialists. The project owner shall maintain these files for a period of three years after completion and approval of the CPM-approved PRR. The project owner shall be responsible to pay curation fees for fossils collected and curated as a result of paleontological monitoring and mitigation.

**PAL-7** The project owner shall ensure preparation of a Paleontological Resources Report (PRR) by the designated PRS. The PRR shall be prepared following completion of the ground disturbing activities. The PRR shall include an analysis of the recovered fossil materials and related information and submitted to the CPM for review and approval.

The report shall include, but not be limited to, a description and inventory of recovered fossil materials; a map showing the location of paleontological resources encountered; determinations of sensitivity and significance; and a statement by the PRS that project impacts to paleontological resources have been mitigated.

**Verification:** Within ninety (90) days after completion of ground disturbing activities, including landscaping, the project owner shall submit the Paleontological Resources Report under confidential cover.

# **Certification of Completion of Worker Environmental Awareness Program EAST ALTAMONT ENERGY CENTER (01-AFC-4)**

This is to certify these individuals have completed a mandatory California Energy Commission-approved Worker Environmental Awareness Program (WEAP). The WEAP includes pertinent information on Cultural, Paleontology & Biology Resources for all personnel (i.e. construction supervisors, crews and plant operators) working on-site or at related facilities. By signing below, the participant indicates that they understand and shall abide by the guidelines set forth in the Program materials. Please include this completed form in your Monthly Compliance Report.

<b>No.</b>	<b>Employee Name</b>	<b>Company</b>	<b>Signature</b>
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Cul Trainer: \_\_\_\_\_ Signature: \_\_\_\_\_ Date: \_\_\_\_/\_\_\_\_/\_\_\_\_

PaleoTrainer: \_\_\_\_\_ Signature: \_\_\_\_\_ Date: \_\_\_\_/\_\_\_\_/\_\_\_\_

Bio Trainer: \_\_\_\_\_ Signature: \_\_\_\_\_ Date: \_\_\_\_/\_\_\_\_/\_\_\_\_

## REFERENCES

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